Claim Listing

1–18. (cancelled)

19. (new) A method of forming a web in a twin-wire formation section of a paper or board machine, comprising the steps of:

supplying and guiding a fibrous stock from a headbox between a first forming wire forming a first wire loop, and a second forming wire forming a second wire loop;

removing water from the fibrous stock in a first dewatering zone, wherein at least a part of the first dewatering zone has at least one fixed forming shoe, having a leading edge and provided with a deck having a curved surface, and wherein the second forming wire is supported by and moves against an area defined by the curved surface of the shoe while the first forming wire positioned opposite the second forming wire is unsupported in the area defined by the curved surface of the shoe, wherein essentially non-pulsating dewatering takes place in the first dewatering zone;

removing water from the fibrous stock in a successive second dewatering zone through which the first forming wire, the second forming wire and the fibrous stock therebetween travel, the second dewatering zone formed by fixed dewatering blades which extend in a cross-machine direction, and engage one of the forming wires, the fixed dewatering blades defining gaps therebetween; and

supporting against the other of the forming wires movable dewatering blades, which are loaded in a controlled fashion opposite the gaps and between the fixed dewatering blades against the fibrous stock between the forming wires so that the second dewatering zone causes pulsating dewatering in the fibrous stock.

20. (new) The method of claim 19, further comprising the step of applying underpressure to the fibrous stock through the deck of the fixed forming shoe.

21. (new) The method of claim 19, wherein the fibrous stock is guided onto the deck of the fixed forming shoe with the aid of one of the forming wires in such a way that the fibrous stock will be in contact with the other forming wire after the leading edge of the forming shoe.

22. (new) The method of claim 19 wherein the step of supplying and guiding the fibrous stock from a headbox between the first forming wire forming the first wire loop, and the second forming wire forming the second wire loop is carried out in a blade type gap former, and wherein the headbox has a lip jet directed into a gap formed between the first wire loop and the second wire loop, on to the first forming wire upstream of the fixed forming shoe.

23. (new) The method of claim 22, wherein the forming wire is not supported where the lip jet of the headbox is directed thereon.

24. (new) The method of claim 19,wherein the step of supplying and guiding a fibrous stock from the headbox between the first forming wire forming the first wire loop, and the second forming wire forming the second wire loop is carried out in a roll and blade gap former equipped with a forming roll within one of the wire loops, and wherein the first non-pulsating dewatering zone is formed with the forming roll followed by the fixed forming shoe and wherein the fibrous stock is guided with the aid of the forming roll into contact with the fixed forming shoe.

25. A twin-wire forming section of a paper or board machine, comprising:

a first forming wire forming a first wire loop with the aid of first guiding rolls and first hitch rolls;

a second forming wire forming a second wire loop with the aid of second guiding rolls and second hitch rolls;

the first forming wire and the second forming wire forming a twin-wire dewatering area therebetween, said area having a beginning, the dewatering area arranged in to at least a first dewatering zone, and a second successive dewatering zone;

wherein at least a part of the first dewatering zone is formed with at least one fixed forming shoe having a curved surface deck, and a leading edge, the curved surface deck in supporting engagement with the second forming wire;

wherein the first forming wire is unsupported over the fixed forming shoe;

wherein the second and successive dewatering zone is formed by a plurality of fixed dewatering blades engaging one of the forming wires in the cross-machine direction and supported against the fibrous stock between the first forming wire and the second wire, wherein the fixed dewatering blades define gaps therebetween;

a plurality of movable dewatering blades mounted for a loading motion in a controlled manner against the fibrous stock located between the first forming wire and the second wire, the movable dewatering blades being opposite the gaps and engaging the other forming wire at the gaps in between the fixed dewatering blades, so causing pulsating dewatering in the fibrous stock in the second dewatering zone;

wherein the first forming wire and the second forming wire are guided from the beginning of the twin-wire forming section into the area of the fixed forming shoe of the first dewatering zone, and wherein the fixed forming shoe is provided with an essentially open surface and a source of underpressure arranged under the forming shoe so as to cause essentially non-pulsating dewatering in the fibrous stock traveling in between the forming wires; and

wherein the non-pulsating dewatering in the first zone is applied to the fibrous stock in an area after the leading edge of the forming shoe.

26. (new) The apparatus of claim 25, wherein the headbox is fitted to feed the jet of fibrous stock on to the first forming wire at a location spaced away from the fixed forming shoe, and wherein the first wire is arranged to bring the fibrous stock into the area of the fixed forming shoe in such a way that the fibrous stock will be in contact with the second forming wire after the leading edge of the fixed forming shoe.

27. (new) The apparatus of claim 25 wherein the forming section is a blade type gap former, having a gap where the first forming wire and the second forming wire come together, and into the gap of which the lip jet of the headbox is directed on to the one of the forming wires before the fixed forming shoe which is located farther away from the fixed forming shoe.

28. (new) The apparatus of claim 25, wherein the lip jet of the headbox is directed on to the first forming wire located spaced away from the fixed forming shoe into an unsupported area of the first forming wire located before the fixed forming shoe.

29. (new) The apparatus of claim 25, wherein the lip jet of the headbox is directed on to the first forming wire located spaced away from the fixed forming shoe into an unsupported area of the one of the forming wires located farther away from the fixed forming shoe at a location before the fixed forming shoe.

30. (new) The apparatus of claim 25, wherein the forming section is a roll and blade gap former, and the first dewatering zone includes a forming roll and a fixed forming shoe fitted after it, wherein the fibrous stock is guided with the aid of the forming roll to be in contact with the fixed forming shoe.

31. (new) The apparatus of claim 25, wherein the open surface area of the deck of the fixed forming shoe is at least 50 percent of the total surface area of the shoe.

32. (new) The apparatus of claim 25, wherein the open surface area of the deck of the fixed forming shoe is formed of holes extending through the deck.

33. (new) The apparatus of claim 32, wherein the holes extending through the deck and forming the open surface area of the deck of the fixed forming shoe are arranged at an angle in relation to the top surface of the deck and against a first direction and wherein the first wire and the second wire are mounted to travel in the first direction.

34. The apparatus of claim 25, wherein the radius of curvature of the deck of the fixed forming shoe is between 600 mm and 4000 mm.

35. A twin-wire forming section of a paper or board machine, comprising:

a fourdrinier first forming wire forming a first loop;

a former unit fitted on top of the fourdrinier wire, the forming unit having a second forming wire forming a second wire loop;

the fourdrinier first forming wire and the second forming wire forming a twin-wire dewatering area therebetween, said area having a beginning; in such a way that at the beginning of the twin-wire dewatering area a wedge-like gap is formed, into which a fibrous stock on the fourdrinier first forming wire travels;

wherein the twin-wire dewatering area is arranged into at least a first dewatering zone and a second successive dewatering zone;

wherein at least a part of the first dewatering zone is formed with at least one fixed forming shoe having a curved surface deck, and a leading edge, the curved surface deck in engagement with the second forming wire;

wherein the fourdrinier first forming wire is unsupported at the fixed forming shoe;

wherein the second and successive dewatering zone is formed by a plurality of fixed dewatering blades engaging the second forming wire in the cross-machine direction and supported against the fibrous stock between the second forming wire and the fourdrinier first forming wire;

wherein the fixed dewatering blades define gaps therebetween;

a plurality of movable dewatering blades mounted for a loading motion in a controlled manner against the fibrous stock located between the fourdrinier first forming wire and the second forming wire, the movable dewatering blades opposite the gaps and engaging the fourdrinier first forming wire at the gaps in between the fixed dewatering blades, so causing pulsating dewatering in the fibrous stock in the second dewatering zone;

wherein the fourdrinier first forming wire and the second forming wire are guided from the beginning of the twin-wire forming section into the area of the fixed forming shoe of the first dewatering zone, and that the fixed forming shoe is provided with an essentially open surface and a source of underpressure

arranged under the forming shoe so as to cause essentially non-pulsating dewatering in the fibrous stock traveling in between the forming wires; and

wherein the non-pulsating dewatering in the first zone is applied to the fibrous stock in an area after the leading edge of the forming shoe.

36. (new) A method of forming a web in a twin-wire formation section of a paper or board machine, comprising the steps of:

supplying and guiding a fibrous stock from a headbox onto a fourdrinier first forming wire forming a fourdrinier former, the fourdrinier first forming wire forming a first wire loop;

forming a hybrid former and twin-wire forming section with a second forming wire positioned on top of the fourdrinier first forming wire, and forming a second wire loop;

removing water from the fibrous stock in a first dewatering zone, wherein at least a part of the first dewatering zone has at least one fixed non-pulsating forming shoe, having a leading edge and provided with a deck having a curved surface, and wherein the second forming wire is supported by and moves against an area defined by the curved surface of the shoe while the fourdrinier first forming wire positioned opposite the second forming wire is unsupported in the area defined by the curved surface of the shoe;

removing water from the fibrous stock in a successive second dewatering zone through which the fourdrinier first forming wire, the second forming wire and the fibrous stock travel therebetween, the second dewatering zone formed by fixed dewatering blades extending in a cross-machine direction, and engaging the second forming wire, the fixed dewatering blades defining gaps therebetween; and

supporting against the fourdrinier forming wire movable dewatering blades, which are loaded in a controlled fashion opposite the gaps and between the fixed dewatering blades against the fibrous stock between the forming wires so that the second dewatering zone causes pulsating dewatering in the fibrous stock.